14.

Eastern Pacific Expeditions of the New York Zoological Society, XIV.

Introduction, Itinerary, List of Stations, Nets and Dredges of the Eastern Pacific *Zaca* Expedition, 1937-1938.[1]

William Beebe

Department of Tropical Research
New York Zoological Society

(Text-figures 1 & 2).

[This is the fourteenth of a series of papers dealing with the collections made in the eastern Pacific by the expeditions of the New York Zoological Society. The first thirteen of the series appeared under the heading of "The Templeton Crocker Expedition." As it is necessary to simplify the titles of future reports, all publications dealing with the materials gathered in this region will appear from now on under the title of the "Eastern Pacific Expeditions of the New York Zoological Society." Under this name will appear the results of work of the *Noma* (1923), *Arcturus* (1925), *Antares* (1933), Templeton Crocker (1936) and the Eastern Pacific *Zaca* (1937-1938) Expeditions.]

Introduction.

The Twenty-sixth Expedition of the Department of Tropical Research was made possible by Mr. Templeton Crocker's generous offer of the use of his yacht *Zaca* for the second time. Mr. Crocker accompanied the expedition together with his friend Mr. Maurice Willows. The scientific personnel was the same as on the first trip and consisted of four members of the Tropical Research Department, Dr. William Beebe, Director; Mr. John Tee-Van, General Associate; Miss Jocelyn Crane, Technical Associate; and Mr. George Swanson, Artist. Toshio Asaeda was, as before, photographer and preparateur, and together with Captain Alfred Pedersen and the entire crew were most efficient and helpful in every way.

The *Zaca* is a Diesel schooner, 118 feet over all, with a gross tonnage of 84. She is supplied with all of the usual apparatus for capturing fish and animals, such as seines, nets, submerged lights, etc.; in addition Mr. Crocker provided for these expeditions, a gasoline-engined winch and a 7,500-foot length of ¼-inch-diameter steel cable. With this apparatus we were able to trawl down to a maximum depth of 500 fathoms and to dredge on the bottom with deep-sea dredges. Two valuable features of the vessel were the bow pulpit and the boom-walk copied after those which I first used on the *Arcturus* in 1925.

[1] Contribution Number 560, Department of Tropical Research, New York Zoological Society. For corresponding List of Stations of the First *Zaca* Trip, see *Zoologica*, Vol. XXII, No. 2.

Itinerary.

The route of the expedition is shown on the two accompanying maps. We left San Diego on November 6, 1937, and disbanded at Balboa on April 5, 1938. The route is indicated by the successive numbers of the Stations.

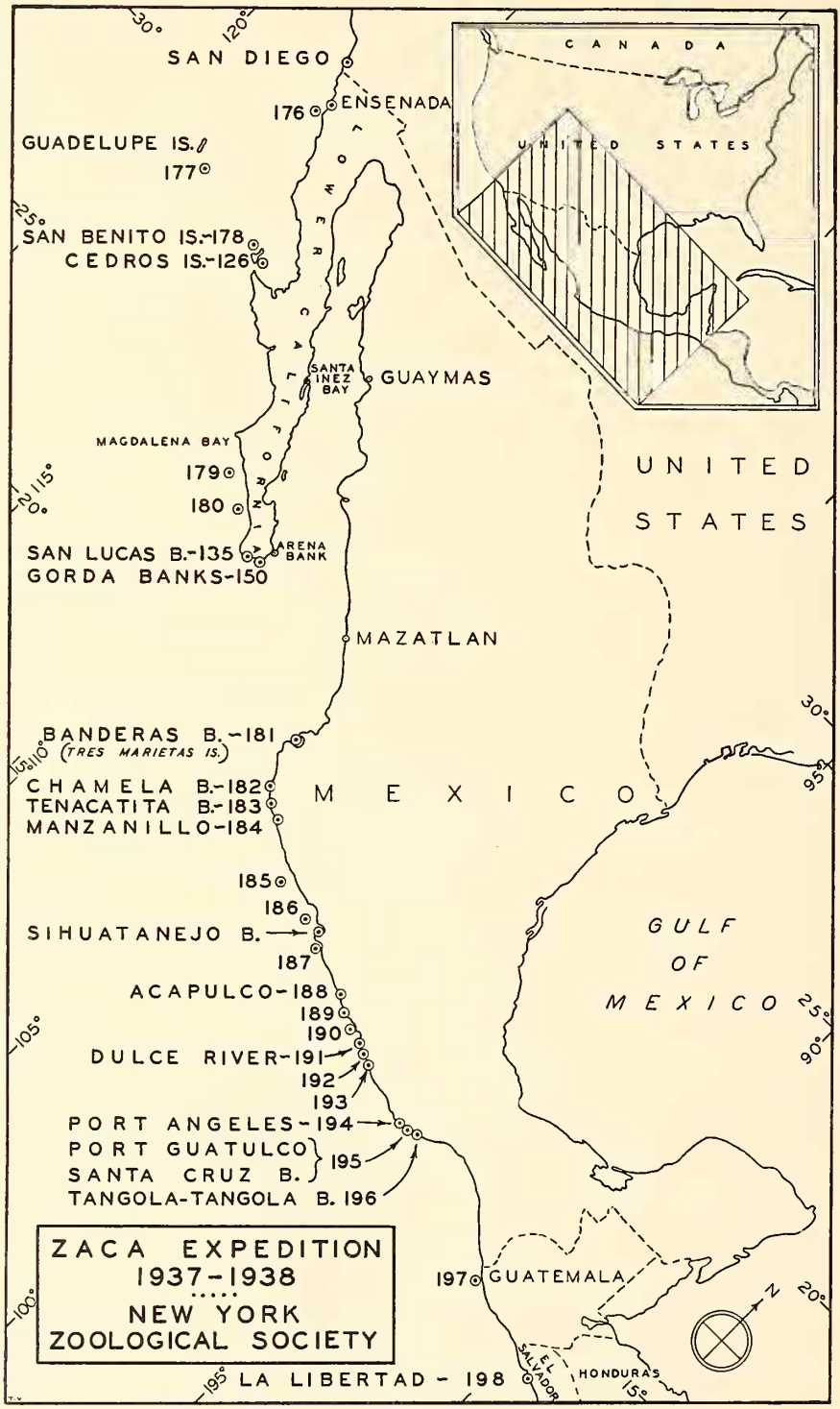
The dates and time spent at the various localities are as follows: San Diego, November 5; MEXICO: Ensenada, November 6; Guadelupe Island, November 8; San Benito Islands, November 9 and 10; Cedros Island, November 10; Cape San Lucas, November 13; Penas, Banderas Bay, November 15 and 16; Chamela Bay, November 17 to 20; Tenacatita Bay, November 20; Manzanillo, November 21 and 22; Sihuatanejo Bay, November 24; Acapulco, November 25 to 29; Port Angeles, December 1; Port Guatulco, December 2 to 7; Santa Cruz Bay, December 7 and 8; Tangola-Tangola, December 8 to 13; EL SALVADOR: La Libertad, December 16 to 19; La Union, December 20 and 21; Meanguera Island, December 21 and 22; Farrallone Islands, December 22; Conchaguita Island, December 22; La Union, December 22 and 23, and 26 and 27; NICARAGUA: Potosi River, December 23 to 25; Monypenny Point, December 25 and 26; Corinto, December 28 to January 7; San Juan del Sur, January 9 to 12; COSTA RICA: Port Parker, January 12 to 23;; Murcielago Bay, January 23; Potrero Grande Bay, January 23 and 24; Port Culebra, January 24 to 31; Cocos Bay, January 26, 29 and 31; Braxilito Bay, January 31 to February 1; Piedra Blanca Bay, February 1 to 6; Puntarenas, February 11 and 12; Cedro Island, February 12 and 13; Puntarenas, February 13 to 21; Cedro Island, February 21 and 22; Negritas Island, February 22; Jasper Island, February 22 to 25; Ballenas Bay, February 25 and 26; Puntarenas, February 28 to March 1; Uvita Bay, March 2 to 4; Golfito, Gulf of Dulce, March 5 to 9; Pavon Bay, March 9 and 10; PANAMA: Puerto Armuelles, March 11; Parida Island, March 11 to 13; Bahia Honda, March 13 to 19; Hermosa Bay, Coiba Island, March 19 and 20; Hannibal Bank, March 20; Balboa, C.Z., March 22 to 24; COLOMBIA: Gorgona Island, March 27 to April 2; PANAMA: Balboa, April 5.

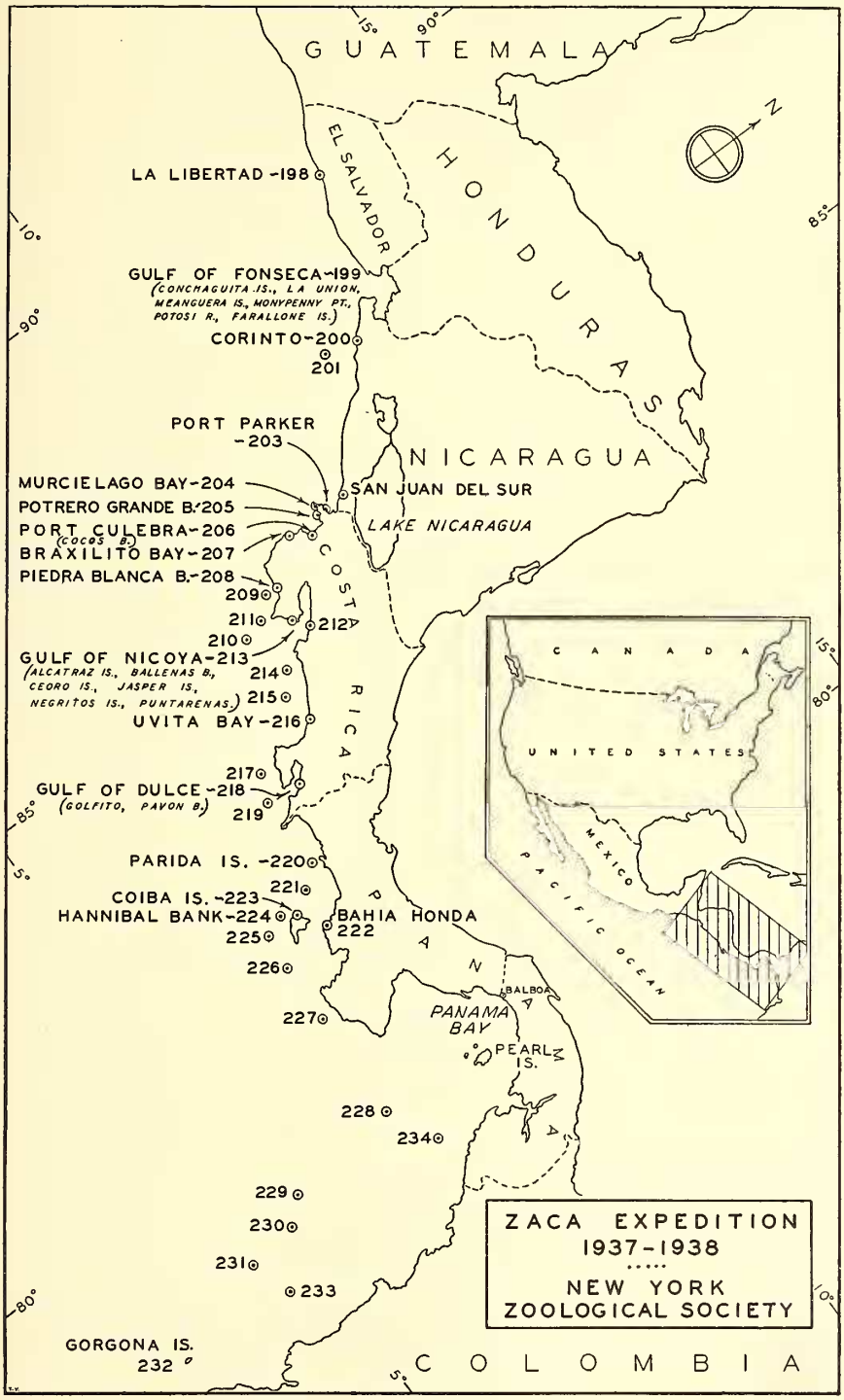
List of Stations, Nets and Dredges.

The data presented in the following tables are self-explanatory. Abbreviations are as follows: The Station numbers refer to the continuously numbered series of oceanographic stations of the Department of Tropical Research. In the second column the letter "D" refers to dredges, "T" to tow-nets and "L" to submarine night lights. Hence, 182, D-1 means the first dredge drawn at Station 182.

In the third column the dredges are separated into two- and four-foot ones, the measurement being across the mouth. Both sizes were of the Blake type, the bags being of two-inch and one-inch mesh respectively. The small dredges were drawn from launch or dory, the large ones being handled from the deck of the yacht, using the quarter-inch steel cable. The tow-nets of one-half and one metre diameter were of standard Michael Sars' type, with 2XX silk bolting cloth posteriorly and OXX bolting cloth anteriorly, the mouth of the net having a collar of shrimp netting. The lights indicated refer to night stations, where submerged electric lights were employed, and the captures made by the use of long-handled dip-nets.

Station No.	Net No.	Type of Net	Depth		Position		General Locality	Date 1937	Bottom	Duration	
			Fathoms	Metres	N. Lat.	W. Long.				Hrs.	Mins.
								Nov.			
126	D-13	4′ dredge	45	82	28° 12′	115° 07′	E. of Cedros Is., Mex.	10	Mud, algae.	—	10
	D-14	4′ dredge	45	82	28° 10′	115° 08′	"	10	"	—	10
	D-15	4′ dredge	42	76	28° 09′	115° 08′	"	10	Mud.	—	10
	D-16	4′ dredge	42	76	28° 07′	115° 08′	"	10	"	—	20
	D-17	4′ dredge	40	73	28° 05′	115° 09′	"	10	"	—	10
	D-18	4′ dredge	20	36	28° 01′	115° 10′	SE. of Cedros Is., Mex.	10	Rocks, algae.	—	10
	D-19	4′ dredge	25	45	27° 59′	115° 09′	"	10	"	—	10
135	D-27	2′ dredge	2–6	3.6–11	22° 53′	109° 54′	San Lucas Bay, Mex.	13	Sand.	—	20
150	D-27	4′ dredge	60	108	23° 01′	109° 28′	Gorda Banks, Mex.	13	"	—	20
176	L-1	Light	—	—	31° 25′	116° 58′	23 m. S.xW. of Banda Point, Mex.	7	—	1	10
177	L-1	Light	—	—	28° 42′	117° 50′	30 m. E.xS. of Guadalupe Is., Mex.	8	—	—	30
178	L-1	Light	—	—	28° 18′	115° 34′	San Benito Is., Mex.	9	—	2	00
179	T-1	½ Metre	0	0	24° 02′	111° 38′	18 m. SSE. of Pt. Tosca, Mex.	12	—	—	10
180	T-1	½ Metre	0	0	23° 31′	110° 54′	65 m. NW. of Cape Falso, Mex.	12	—	—	10
181	L-1	Light	—	—	20° 36′ 30″	105° 16′	Banderas Bay, Mex.	15	—	2	0
182	D-1	4′ dredge	8	14.5	19° 34′ 30″	105° 08′ 15″	Chamela Bay, Mex.	17	Sand, algae.	—	10
	D-2	4′ dredge	12	22	19° 34′	105° 07′ 30″	"	17	"	—	10
	D-3	4′ dredge	15	27	19° 33′ 45″	105° 07′ 45″	"	17	"	—	10
	D-4	4′ dredge	16	29	19° 33′ 30″	105° 08′ 15″	"	17	Sand, algae, cr. shell.	—	10
	L-1	Light	—	—	19° 34′ 45″	105° 08′ 30″	"	17	—	2	0
	L-2	Light	—	—	19° 34′ 45″	105° 08′ 30″	"	18	—	2	0
183	D-1	4′ dredge	15	27	19° 17′	104° 51′	Tenacatita Bay, Mex.	21	Sand.	—	10
	D-2	4′ dredge	30	54	19° 15′ 30″	104° 51′	"	21	Muddy sand.	—	15
	D-3	4′ dredge	40	73	19° 14′ 30″	104° 51′ 30″	"	21	Sandy mud.	—	15
	D-4	4′ dredge	40	73	19° 14′ 30″	104° 52′ 30″	"	21	Mud.	—	15
	L-1	Light	—	—	19° 18′	104° 51′	"	20	—	2	30
184	D-1	4′ dredge	25	45	19° 03′ 45″	104° 20′ 45″	Manzanillo, Mex.	22	Sand.	—	10
	D-2	4′ dredge	30	55	19° 04′	104° 22′	"	22	Grav'ly sand.	—	20
	L-1	Light	—	—	19° 03′ 30″	104° 19′ 45″	"	21	—	3	0
185	T-1	Metre	300	545	17° 45′	103° 05′	43 m. SE. of Pt. Telmo, Mex.	23	—	2	0
	T-2	Metre	400	730	17° 45′	103° 05′	"	23	—	2	0
	T-3	Metre	500	910	17° 45′	103° 05′	"	23	—	2	0
	T-4	½ Metre	0	0	17° 45′	103° 05′	"	23	—	0	30
186	L-1	Light	—	—	17° 38′	102° 00′	20 m. W. of Sihuatanejo, Mex.	23	—	2	30
187	L-1	Light	—	—	17° 17′	101° 16′	72 m. WNW. of Acapulco, Mex.	24	—	0	30
188	L-1	Light	—	—	16° 15′ 30″	99° 55′ 30″	Acapulco, Mex.	25	—	2	0
	L-2	Light	—	—	16° 15′ 30″	99° 55′ 30″	"	26	—	2	0
	L-3	Light	—	—	16° 15′ 30″	99° 55′ 30″	"	27	—	2	0
	L-4	Light	—	—	16° 15′ 30″	99° 55′ 30″	"	28	—	2	0
189	D-1	4′ dredge	20	36	16° 40′	99° 43′ 30″	17 m. SE.xE. of Acapulco, Mex.	29	Sandy mud, algae.	—	10
	D-2	4′ dredge	20	36	16° 39′ 30″	99° 42′	"	29	"	—	20
	D-3	4′ dredge	13	23.5	16° 39′	99° 41′	"	29	Mud.	—	10
	D-4	4′ dredge	28	51	16° 38′ 30″	99° 40′	"	29	"	—	14
190	L-1	Light	—	—	16° 30′	99° 13′	45 m. ESE. of Acapulco, Mex.	29	—	1	0
191	D-1	2′ dredge	8	14.5	16° 29′	98° 45′	Mouth of Dulce Riv., Mex.	30	—	0	10
192	D-1	4′ dredge	26	47	16° 16′ 30″	98° 37′	4 m. SSW. of Maldanado Pt., Mex.	30	Mud.	—	10


SAN DIEGO
ENSENADA
176
GUADELUPE IS.
177
SAN BENITO IS.-178
CEDROS IS.-126
SANTA INEZ BAY
GUAYMAS
MAGDALENA BAY
179
180
SAN LUCAS B.-135
ARENA BANK
GORDA BANKS-150
MAZATLAN
BANDERAS B.-181
(TRES MARIETAS IS.)
CHAMELA B.-182
TENACATITA B.-183
MANZANILLO-184
185
186
SIHUATANEJO B.
187
ACAPULCO-188
189
190
DULCE RIVER-191
192
193
PORT ANGELES-194
PORT GUATULCO
SANTA CRUZ B.
195
TANGOLA-TANGOLA B. 196
ZACA EXPEDITION
1937-1938
NEW YORK
ZOOLOGICAL SOCIETY
197 GUATEMALA
EL SALVADOR
HONDURAS
LA LIBERTAD - 198
MEXICO
GULF OF MEXICO
UNITED STATES
CANADA
UNITED STATES
30°
120°
25°
115°
110°
105°
100°
95°
90°
20°
15°
N


GUATEMALA
EL SALVADOR
HONDURAS
NICARAGUA
COSTA RICA
PANAMA
COLOMBIA
LA LIBERTAD -198
GULF OF FONSECA-199
(CONCHAGUITA IS., LA UNION, MEANGUERA IS., MONYPENNY PT., POTOSI R., FARALLONE IS.)
CORINTO-200
201
PORT PARKER -203
MURCIELAGO BAY-204
POTRERO GRANDE B.-205
PORT CULEBRA-206
(COCOS B.)
BRAXILITO BAY-207
PIEDRA BLANCA B.-208
209
211
212
210
GULF OF NICOYA-213
(ALCATRAZ IS., BALLENAS B., CEORO IS., JASPER IS., NEGRITOS IS., PUNTARENAS.)
214
215
UVITA BAY-216
217
GULF OF DULCE-218
(GOLFITO, PAVON B.)
219
PARIDA IS. -220
221
COIBA IS. -223
HANNIBAL BANK-224
225
BAHIA HONDA
222
226
227
BALBOA
PANAMA BAY
PEARL IS.
228
234
229
230
231
233
GORGONA IS.
232
SAN JUAN DEL SUR
LAKE NICARAGUA
CANADA
UNITED STATES
MEXICO
PACIFIC OCEAN
ZACA EXPEDITION
1937-1938
NEW YORK
ZOOLOGICAL SOCIETY
15°
90°
85°
10°
80°
5°

Station No.	Net No.	Type of Net	Depth		Position		General Locality	Date 1937	Bottom	Duration	
			Fathoms	Metres	N. Lat.	W. Long.				Hrs.	Mins.
								Nov.			
192	D-2	4′ dredge	33	60	16° 16′	98° 36′	4 m. SSW. of Maldanado Pt., Mex.	30	Sand.	—	10
	D-3	4′ dredge	38	69	16° 15′	98° 35′ 30″	"	30	Mud.	—	10
193	L-1	Light	—	—	16° 05′	98° 17′	21 m. SE. of Maldanado Pt., Mex.	30	—	1	10
								Dec.			
194	L-1	Light	—	—	15° 39′ 15″	96° 30′ 40″	Port Angeles, Mex.	1	—	3	0
195	D-1	2′ dredge	2.5	4.5	15° 44′ 56″	96° 08′ 03″	Port Guatulco, Mex.	4	Sand, algae.	—	3
	D-2	2′ dredge	3	5.5	15° 44′ 51″	96° 07′ 51″	"	4	Sand.	—	4
	D-3	2′ dredge	3.5	6.3	15° 44′ 45″	96° 07′ 53″	"	4	Sand, cr. shell	—	3
	D-4	2′ dredge	4.5	8.2	15° 44′ 40″	96° 07′ 53″	"	4	Sand, algae, cr. shell.	—	3
	D-5	2′ dredge	2	3.6	15° 44′ 50″	96° 08′ 09″	"	5	Sand, algae.	—	3
	D-6	2′ dredge	3	5.4	15° 44′ 45″	96° 08′ 05″	"	5	Sand, algae, cr. shell.	—	3
	D-7	2′ dredge	4.5	8.2	15° 44′ 35″	96° 08′	"	5	Rocks.	—	3
	D-8	2′ dredge	6	11	15° 44′ 30″	96° 07′ 56″	"	5	Sand, algae, cr. shell.	—	3
	D-9	2′ dredge	7	12.6	15° 44′ 28″	96° 07′ 51″	"	5	Gr. sand, cr. shell.	—	5
	D-10	2′ dredge	4	7.3	15° 44′ 53″	96° 08′ 03″	"	6	Gr. sand, cr. shell, dead coral.	—	3
	D-11	2′ dredge	5	9.1	15° 44′ 49″	96° 07′ 59″	"	6	Gr. sand, cr. shell.	—	4
	D-12	2′ dredge	6	11	15° 44′ 42″	96° 07′ 55″	"	6	Sand.	—	3
	D-13	2′ dredge	8	14.6	15° 44′ 33″	96° 07′ 49″	"	6	"	—	3
	D-14	2′ dredge	4	7.3	15° 44′ 27″	96° 07′ 57″	"	6	Coral.	—	5
	D-15	Diving	1.5	2.7	15° 44′ 54″	96° 07′ 57″	"	6	"	1	0
	D-16	2′ dredge	10	18.2	15° 44′ 35″	96° 07′ 45″	"	7	Sand.	—	3
	D-17	2′ dredge	6	11	15° 44′ 39″	96° 07′ 42″	"	7	"	—	5
	D-18	2′ dredge	6	11	15° 44′ 39″	96° 07′ 49″	"	7	"	—	3
	D-19	4′ dredge	17	31	15° 44′ 22″	96° 07′ 27″	"	7	Gr. mud, cr. shell.	—	5
	D-20	4′ dredge	23	42	15° 44′ 22″	96° 07′ 08″	"	7	Mud.	—	10
	D-21	4′ dredge	18	33	15° 44′ 45″	96° 06′ 55″	Santa Cruz Bay, Mex.	7	"	—	10
	L-1	Light	—	—	15° 44′ 45″	96° 08′	Port Guatulco, Mex.	3	—	1	30
	L-2	Light	—	—	15° 44′ 45″	96° 08′	"	4	—	2	0
	L-3	Light	—	—	15° 44′ 45″	96° 08′	"	5	—	2	30
196	D-1	2′ dredge	5	9	15° 45′ 58″	96° 06′	Tangola-Tangola Bay, Mex.	9	Gr. sand.	0	3
	D-2	2′ dredge	5.5	10	15° 45′ 53″	96° 05′ 57″	"	9	Sand.	0	3
	D-3	2′ dredge	7	12.8	15° 45′ 48″	96° 05′ 54″	"	9	"	0	3
	D-4	2′ dredge	8	14.5	15° 45′ 44″	96° 05′ 52″	"	9	"	0	3
	D-5	2′ dredge	9	16.3	15° 45′ 40″	96° 05′ 50″	"	9	"	0	5
	D-6	2′ dredge	7	12.8	15° 45′ 34″	96° 06′ 02″	"	9	Sand, cr. shell.	0	5
	D-7	2′ dredge	6	11	15° 45′ 34″	96° 06′ 03″	"	9	Sand.	0	4
	D-8	2′ dredge	9	16.3	15° 45′ 37″	96° 05′ 54″	"	9	"	0	5
	D-9	2′ dredge	7.5	13.6	15° 45′ 45″	96° 05′ 59″	"	12	"	0	3
	D-10	2′ dredge	5	9.1	15° 45′ 51″	96° 06′ 01″	"	12	"	0	3
	D-11	2′ dredge	4.5	8.2	15° 45′ 57″	96° 06′ 02″	"	12	"	0	3
	D-12	2′ dredge	4	7.3	15° 46′ 02″	96° 05′ 58″	"	12	"	0	5
	D-13	2′ dredge	10	18	15° 45′ 32″	96° 05′ 52″	"	12	Gr. sand, cr. shell.	0	3
	D-14	2′ dredge	5	9.1	15° 45′ 34″	96° 06′ 03″	"	12	Cr. shell.	0	5
	D-15	2′ dredge	5	9.1	15° 45′ 34″	96° 06′ 03″	"	12	Cr. shell.	0	5

Station No.	Net No.	Type of Net	Depth		Position		General Locality	Date 1937	Bottom	Duration	
			Fathoms	Metres	N. Lat.	W. Long.				Hrs.	Mins.
								Dec.			
196	D-16	4′ dredge	16	29	15° 45′ 22″	96° 05′ 51″	Tangola-Tangola Bay, Mex.	13	Mud.	0	5
	D-17	4′ dredge	23	42	15° 45′	96° 05′ 34″	"	13	"	0	3
	D-18	4′ dredge	30	55	15° 44′ 58″	96° 05′ 13″	"	13	"	0	3
	D-19	4′ dredge	30	55	15° 44′	96° 05′	"	13	"	0	3
	D-20	4′ dredge	50	91	15° 43′ 15″	95° 04′ 15″	"	13	"	0	4
	L-1	Light	—	—	15° 45′ 40″	96° 06′ 05″	"	8	—	1	0
	L-2	Light	—	—	15° 45′ 40″	96° 06′ 05″	"	9	—	1	0
	L-3	Light	—	—	15° 45′ 40″	96° 06′ 05″	"	10	—	3	0
	L-4	Light	—	—	15° 45′ 40″	96° 06′ 05″	"	11	—	2	30
	L-5	Light	—	—	15° 45′ 40″	96° 06′ 05″	"	12	—	3	0
197	D-1	4′ dredge	14	25	14° 16′	92° 03′	7 m. W. of Champerico, Guatemala.	15	Mud.	0	5
	D-2	4′ dredge	14	25	14° 13′	92° 02′	"	15	"	0	5
198	D-1	4′ dredge	13	24	13° 27′ 20″	89° 19′ 20″	La Libertad, El Salvador.	16	"	0	5
	D-2	4′ dredge	14	25	13° 25′ 50″	89° 19′ 20″	"	16	"	0	5
	L-1	Light	—	—	13° 28′ 11″	89° 19′ 14″	"	16	—	1	30
	L-2	Light	—	—	13° 28′ 11″	89° 19′ 14″	"	18	—	2	00
199	D-1	4′ dredge	16	29	13° 08′	87° 43′	Meanguera Is., Gulf of Fonseca, El Sal.	23	Sand, mud, cr. shell.	0	3
	D-2	4′ dredge	5	9.1	13° 02′ 30″	87° 29′ 30″	Monypenny Pt., Gulf of Fonseca, Nicar.	24	Mud.	0	1
	D-3	4′ dredge	6	11	13° 03′	87° 30′	"	24	"	0	2
	D-4	4′ dredge	7	12.8	13° 03′ 30″	87° 30′ 20″	"	24	"	0	1
	D-5	4′ dredge	7	12.8	13° 03′ 30″	87° 30′ 20″	"	24	"	0	1
	D-6	4′ dredge	4	7.2	13° 02′ 30″	87° 29′ 30″	"	24	"	0	1
	D-7	4′ dredge	6	11	13° 20′ 07″	87° 49′	La Union, Gulf of Fonseca, El Salv.	27	Mud, mangrove leaves	0	1
	D-8	4′ dredge	6	11	13° 19′ 53″	87° 48′ 43″	"	27	"	0	2
	D-9	4′ dredge	5	9.1	13° 19′ 45″	87° 48′ 32″	"	27	"	0	2
	D-10	4′ dredge	5	9.1	13° 19′ 35″	87° 48′ 19″	"	27	Mud.	0	3
	D-11	4′ dredge	5	9.1	13° 19′ 24″	87° 48′ 00″	"	27	"	0	1½
	D-12	4′ dredge	5	9.1	13° 19′ 08″	87° 47′ 30″	"	27	"	0	3
	D-13	4′ dredge	6	11	13° 18′ 50″	87° 47′ 07″	"	27	"	0	1½
	D-14	4′ dredge	5	9.1	13° 19′ 40″	87° 48′ 23″	"	27	"	0	1½
	D-15	4′ dredge	6	11	13° 19′ 52″	87° 48′ 43″	"	27	"	0	1½
	D-16	4′ dredge	6	11	13° 20′ 03″	87° 48′ 57″	"	27	"	0	1½
	D-17	2′ dredge	4	7.2	13° 19′ 54″	87° 49′ 07″	"	27	Mud, mangrove leaves.	0	1½
	D-18	2′ dredge	4	7.2	13° 19′ 50″	87° 49′	"	27	"	0	1½
	D-19	2′ dredge	3	5.4	13° 20′ 03″	87° 49′ 26″	"	27	"	0	1½
	D-20	2′ dredge	3	5.4	13° 20′ 03″	87° 49′ 26″	"	27	"	0	1½
	D-21	2′ dredge	3	5.4	13° 20′ 03″	87° 49′ 26″	"	27	"	0	1½
	D-22	2′ dredge	3	5.4	13° 20′ 03″	87° 49′ 26″	"	27	"	0	1½
	D-23	2′ dredge	3	5.4	13° 20′ 03″	87° 49′ 26″	"	27	"	0	1½
	D-24	2′ dredge	6	11	13° 20′ 03″	87° 49′ 26″	"	27	"	0	1½
	D-25	2′ dredge	6	11	13° 20′ 03″	87° 49′ 26″	"	27	"	0	2
	L-1	Light	—	—	13° 19′ 59″	87° 49′ 15″	"	20	—	3	0
	L-2	Light	—	—	13° 11′	87° 41′ 15″	Meanguera Is., Gulf of Fonseca, El Salv.	21	—	2	0
	L-3	Light	—	—	13° 19′ 59″	87° 49′ 15″	La Union, Gulf of Fonseca, El Salv.	22	—	2	30
	L-4	Light	—	—	13° 02′	87° 29′	Monypenny Pt., Gulf of Fonseca, Nicar.	23	—	2	0
	L-5	Light	—	—	13° 02′	87° 29′ 30″	"	24	—	2	40
200	D-1	2′ dredge	6.5	11.8	12° 28′ 25″	87° 10′ 59″	Corinto, Nicaragua	29	Mangrove leaves.	0	1½

Station No.	Net No.	Type of Net	Depth		Position		General Locality	Date 1937	Bottom	Duration	
			Fathoms	Metres	N. Lat.	W. Long.				Hrs.	Mins.
								Dec.			
200	D-2	2′ dredge	5.3	9.7	12° 28′ 27″	87° 10′ 55″	Corinto, Nicaragua	29	Mangrove leaves.	0	1½
	D-3	2′ dredge	2	3.6	12° 28′ 28″	87° 10′ 51″	"	29	"	0	3
	D-4	2′ dredge	½	.9	12° 28′ 32″	87° 10′ 42″	"	29	"	0	1½
	D-5	2′ dredge	2	3.6	12° 28′ 36″	87° 10′ 48″	"	29	"	0	1½
	D-6	2′ dredge	2.5	4.6	12° 28′ 41″	87° 10′ 42″	"	29	"	0	2
	D-7	2′ dredge	2	3.6	12° 28′ 45″	87° 10′ 34″	"	29	"	0	2
	D-8	2′ dredge	6.6	12	12° 28′ 24″	87° 10′ 58″	"	29	"	0	2
	D-9	2′ dredge	6	11	12° 28′ 27″	87° 11′ 04″	"	29	"	0	2
								1938 Jan.			
	D-10	2′ dredge	7	12.8	12° 27′ 46″	87° 11′ 32″	"	5	"	0	1½
	D-11	2′ dredge	8	14.6	12° 27′ 46″	87° 11′ 32″	"	5	Sand.	0	1½
	D-12	2′ dredge	3	5.4	12° 27′ 20″	87° 11′ 38″	"	5	Mangrove leaves.	0	1½
	D-13	2′ dredge	3	5.4	12° 27′ 14″	87° 11′ 45″	"	5	"	0	3
	D-14	2′ dredge	3	5.4	12° 27′ 30″	87° 12′ 06″	"	5	"	0	3
	D-15	2′ dredge	1	1.8	12° 27′ 32″	87° 12′ 09″	"	5	"	0	5
	D-16	2′ dredge	4–7	7–13	12° 27′ 41″	87° 12′ 08″	"	5	"	0	5
	D-17	2′ dredge	7–10	13–18	12° 27′ 46″	87° 12′ 17″	"	5	Sand.	0	7
	D-18	2′ dredge	5	9.1	12° 27′ 38″	87° 12′ 41″	"	5	Mangrove leaves.	0	5
	D-19	2′ dredge	12–13	22–24	12° 28′ 03″	87° 12′ 39″	"	5	"	0	4
	D-20	2′ dredge	1.5	2.7	12° 27′ 19″	87° 11′ 39″	"	7	"	0	3
	D-21	2′ dredge	2	3.6	12° 27′ 14″	87° 11′ 38″	"	7	"	0	3
	D-22	2′ dredge	1.5	2.7	12° 27′ 07″	87° 11′ 37″	"	7	"	0	5
	D-23	2′ dredge	3	5.4	12° 27′ 20″	87° 11′ 35″	"	7	"	0	5
	D-24	2′ dredge	6.5	11.8	12° 27′ 15″	87° 11′ 55″	"	7	"	0	5
	D-25	2′ dredge	6.5–2.5	11.8–4.5	12° 27′ 10″	87° 11′ 57″	"	7	"	0	10
	D-26	2′ dredge	2.5	4.5	12° 27′ 24″	87° 11′ 15″	"	7	"	0	3
	D-27	2′ dredge	3	5.4	12° 28′ 38″	87° 10′ 42″	"	7	"	0	5
	D-28	2′ dredge	3	5.4	12° 28′ 31″	87° 10′ 45″	"	7	"	0	5
	D-29	2′ dredge	3	5.4	12° 28′ 16″	87° 10′ 49″	"	7	"	0	5
	D-30	2′ dredge	3	5.4	12° 28′ 27″	87° 10′ 47″	"	7	"	0	6
								1937 Dec.			
	L-1	Light	—	—	12° 28′ 22″	87° 11′ 05″	"	28	—	2	15
	L-2	Light	—	—	12° 28′ 22″	87° 11′ 05″	"	29	—	1	30
	L-3	Light	—	—	12° 28′ 22″	87° 11′ 05″	"	30	—	1	0
								1938 Jan.			
201	L-1	Light	—	—	12° 09′	87° 24′	22 m. SW. of Corinto, Nicaragua.	7	—	1	30
202	L-1	Light	—	—	11° 15′ 12″	85° 52′ 58″	S. Juan del Sur, Nicar.	9	—	1	30
203	D-1	4′ dredge	15	27	10° 56′ 05″	85° 49′ 25″	Port Parker, Costa Rica.	20	Sandy mud, cr. shell.	0	4
	D-2	4′ dredge	10	18.2	10° 55′ 38″	85° 49′ 21″	"	20	Shelly sand, algae.	0	5
	D-3	4′ dredge	12	22	10° 55′ 45″	85° 49′ 05″	"	20	Shelly mud.	0	2
	D-4	2′ dredge	7	12.8	10° 55′ 06″	85° 48′ 53″	"	22	Gravel, algae.	0	3
	D-5	2′ dredge	3	5.4	10° 55′ 10″	85° 49′ 10″	"	22	Shells, dead coral.	0	2
	D-6	2′ dredge	1	1.8	10° 55′ 20″	85° 49′ 18″	"	22	Rocks, gravel.	0	3
	D-7	2′ dredge	9–5	16.4–9.1	10° 55′ 43″	85° 49′ 37″	"	22	Shells, algae.	0	5
	D-8	2′ dredge	9	16.4	10° 55′ 43″	85° 49′ 46″	"	22	"	0	5
	D-9	2′ dredge	1.5–4	2.7–7.2	10° 55′ 51″	85° 49′ 52″	"	22	Coral.	0	5
	D-10	2′ dredge	6–2.5	10.9–4.5	10° 56′ 15″	85° 48′ 47″	"	22	Rocks.	0	3

Station No.	Net No.	Type of Net	Depth		Position		General Locality	Date 1938	Bottom	Duration	
			Fathoms	Metres	N. Lat.	W. Long.				Hrs.	Mins.
203	D-11	2′ dredge	2–4	3.6–7.2	10° 56′ 07″	85° 48′ 52″	Port Parker, Costa Rica.	Jan. 22	Rocks.	0	3
	D-12	2′ dredge	2	3.6	10° 55′ 43″	85° 48′ 44″	"	22	Gravel, algae, cr. shell.	0	2
	D-13	2′ dredge	7–9	12.8–16.4	10° 55′ 33″	85° 48′ 30″	"	22	Shells, algae.	0	3
	D-14	2′ dredge	4	7.3	10° 55′ 29″	85° 48′ 24″	"	22	"	0	5
	D-15	2′ dredge	9–2	16.4–3.6	10° 55′ 03″	85° 48′ 25″	"	22	Mangrove leaves, cr. shell, algae.	0	3
	L-1	Light	—	—	10° 55′ 22″	85° 48′ 28″	"	12	—	3	0
	L-2	Light	—	—	10° 55′ 22″	85° 48′ 28″	"	14	—	1	30
	L-3	Light	—	—	10° 55′ 51″	85° 48′ 58″	"	16	—	1	30
	L-4	Light	—	—	10° 55′ 51″	85° 48′ 58″	"	17	—	1	45
204	D-1	2′ dredge	3	5.4	10° 52′ 08″	85° 52′ 30″	Murcielago Bay, Costa Rica.	23	Sand.	0	3
	D-2	2′ dredge	4	7.3	10° 52′ 05″	85° 52′ 27″	"	23	"	0	3
	D-3	2′ dredge	2.5	4.5	10° 52′ 01″	85° 52′ 23″	"	23	"	0	5
	D-4	2′ dredge	2	3.6	10° 51′ 55″	85° 52′ 19″	"	23	"	0	5
205	L-1	Light	—	—	10° 50′ 45″	85° 45′ 30″	Potrero Grande Bay, Costa Rica.	23	—	2	30
206	D-1	4′ dredge	14	25.5	10° 37′ 03″	85° 41′ 12″	Port Culebra, Costa Rica.	30	Sandy mud.	0	3
	D-2	4′ dredge	14	25.5	10° 36′ 47″	85° 41′ 10″	"	30	"	0	4
	D-3	4′ dredge	14	25.5	10° 36′ 22″	85° 41′ 08″	"	30	"	0	5
	L-1	Light	—	—	10° 37′ 10″	85° 41′ 18″	"	25	—	2	0
	L-2	Light	—	—	10° 37′ 50″	85° 39′	"	28	—	1	45
	L-3	Light	—	—	10° 35′ 45″	85° 40′ 15″	"	29	—	1	45
	L-4	Light	—	—	10° 35′ 45″	85° 40′ 15″	"	30	—	2	15
207	L-1	Light	—	—	10° 25′ 20″	85° 48′ 45″	Braxilito Bay, Costa Rica.	31	—	2	40
208	D-1	2′ dredge	6	11	9° 51′ 57″	85° 29′ 55″	Piedra Blanca Bay, Costa Rica.	Feb. 5	Rocks, sand, algae.	0	3
	D-2	2′ dredge	5	9.1	9° 51′ 54″	85° 29′ 53″	"	5	"	0	3
	D-3	2′ dredge	4	7.3	9° 51′ 52″	85° 29′ 46″	"	5	"	0	3
	D-4	2′ dredge	6	10.9	9° 51′ 49″	85° 29′ 41″	"	5	"	0	3
	D-5	2′ dredge	5	9.1	9° 51′ 47″	85° 29′ 34″	"	5	"	0	3
	D-6	2′ dredge	3	5.4	9° 51′ 48″	85° 29′ 32″	"	5	"	0	5
	D-7	2′ dredge	3	5.4	9° 52′ 06″	85° 29′ 49″	"	5	"	0	3
	D-8	2′ dredge	3	5.4	9° 52′ 06″	85° 30′	"	5	"	0	5
	D-9	2′ dredge	3	5.4	9° 52′ 05″	85° 30′ 09″	"	5	"	0	5
	D-10	2′ dredge	2	3.6	9° 51′ 51″	85° 30′ 20″	"	5	"	0	4
	L-1	Light	—	—	9° 51′ 47″	85° 29′ 56″	"	1	—	2	40
	L-2	Light	—	—	9° 51′ 47″	85° 29′ 56″	"	2	—	2	0
	L-3	Light	—	—	9° 51′ 47″	85° 29′ 56″	"	3	—	2	0
209	L-1	Light	—	—	9° 45′	85° 26′	22 m. WNW. of Cape Blanco, Costa Rica	6	—	0	45
	T-1	½ Metre	0	0	9° 41′	85° 24′	"	6	—	0	15
210	L-1	Light	—	—	9° 15′	85° 09′	20 m. S. of Cape Blanco, Costa Rica.	7	—	2	0
	L-2	Light	—	—	9° 14′	85° 07′	"	8	—	2	30
	L-3	Light	—	—	9° 13′	85° 09′	"	26	—	3	0
	T-1	Metre	300	540	9° 12′	85° 05′	"	7	—	4	0
	T-2	Metre	400	730	9° 12′	85° 05′	"	7	—	4	0
	T-3	Metre	500	910	9° 12′	85° 05′	"	7	—	4	0
	T-4	½ Metre	2	3.6	9° 12′	85° 05′	"	7	—	0	30
	T-5	½ Metre	2	3.6	9° 12′	85° 05′	"	7	—	0	30

Station No.	Net No.	Type of Net	Depth		Position		General Locality	Date 1938	Bottom	Duration	
			Fathoms	Metres	N. Lat.	W. Long.				Hrs.	Mins.
								Feb.			
210	T-6	Metre (3 nets)	500	910	9° 12′	85° 05′	20 m. S. of Cape Blanco, Costa Rica.	7	—	2	53
	T-7	Metre (3 nets)	500	910	9° 09′	85° 04′	"	8	—	4	25
	T-8	Metre (3 nets)	500	910	9° 12′	85° 10′	"	27	—	3	26
	T-9	Metre	200	360	9° 11′	85° 08′ 30″	"	27	—	3	32
	T-10	Metre (2 nets)	500	910	9° 11′	85° 08′ 30″	"	27	—	3	32
	T-11	½ Metre	3	5.4	9° 11′	85° 08′ 30″	"	27	—	1	0
211	L-1	Light	—	—	9° 29′	85° 08′	6 m. SW. of Cape Blanco, Costa Rica.	10	—	0	20
212	L-1	Light	—	—	9° 58′ 15″	84° 59′ 45″	Puntarenas, Costa Rica	11	—	8	0
213	D-1	2′ dredge	8	14.6	9° 50′ 52″	84° 53′ 07″	Cedro Island, Gulf of Nicoya, Costa Rica	13	Mud.	0	3
	D-2	2′ dredge	4	7.2	9° 50′ 46″	84° 53′ 05″	"	13	"	0	3
	D-3	2′ dredge	4	7.2	9° 50′ 41″	84° 53′ 03″	"	13	"	0	1
	D-4	2′ dredge	5	9.1	9° 50′ 39″	84° 53′ 07″	"	13	"	0	2
	D-5	2′ dredge	4	7.2	9° 50′ 37″	84° 53′ 12″	"	13	"	0	2
	D-6	2′ dredge	4	7.2	9° 50′ 38″	84° 53′ 14″	"	13	Mud, sand, cr. shell	0	2
	D-7	2′ dredge	4	7.2	9° 50′ 42″	84° 53′ 17″	"	13	"	0	2
	D-8	2′ dredge	4	7.2	9° 50′ 45″	84° 53′ 19″	"	13	"	0	3
	D-9	2′ dredge	6	11	9° 50′ 52″	84° 53′ 23″	"	13	"	0	4
	D-10	2′ dredge	10	18.2	9° 51′ 01″	84° 53′ 22″	"	13	Mud.	0	3
	D-11	4′ dredge	35	63.7	9° 44′ 52″	84° 51′ 25″	Off Ballenas Bay, Gulf of Nicoya, Costa Rica	25	"	0	3
	D-12	4′ dredge	35	63.7	9° 44′ 24″	84° 51′ 03″	"	25	"	0	5
	D-13	4′ dredge	35	63.7	9° 43′ 45″	84° 51′ 08″	"	25	"	0	5
	D-14	4′ dredge	35	63.7	9° 43′	84° 51′ 17″	"	25	"	0	5
	D-15	4′ dredge	40	73	9° 42′ 10″	84° 51′ 25″	"	25	"	0	5
	D-16	4′ dredge	45	82	9° 41′ 10″	84° 51′ 45″	"	25	"	0	5
	D-17	4′ dredge	35	63.7	9° 42′	84° 56′	"	25	"	0	5
	D-18	4′ dredge	80	145	9° 29′ 30″	85° 06′ 40″	3 m. off Cape Blanco, Costa Rica.	26	"	0	10
	L-1	Light	—	—	9° 51′ 30″	84° 52′ 30″	Cedro Island, Gulf of Nicoya, Costa Rica	21	—	2	30
	L-2	Light	—	—	9° 47′	84° 53′ 30″	Alcatraz Is., Gulf of Nicoya, Costa Rica	22	—	2	0
	L-3	Light	—	—	9° 46′ 20″	84° 53′ 05″	Jasper Is., Gulf of Nicoya, Costa Rica	23	—	2	30
	L-4	Light	—	—	9° 44′ 25″	84° 59′ 35″	Ballenas Bay, Gulf of Nicoya, Costa Rica	25	—	3	00
								Mar.			
214	D-1	4′ dredge	42	76.5	9° 19′ 32″	84° 29′ 30″	14 m. S.xE. of Judas Pt., Costa Rica	1	Mud, shell.	0	5
	D-2	4′ dredge	43	78	9° 18′ 45″	84° 29′ 15″	"	1	Mud.	0	10
	D-3	4′ dredge	50	91	9° 18′ 05″	84° 28′ 25″	"	1	"	0	10
	D-4	4′ dredge	61	112	9° 17′ 40″	84° 27′ 30″	"	1	Mud, rocks	0	10
215	L-1	Light	—	—	9° 03′	84° 06′	23 m. W. of Uvita Bay, Costa Rica.	1	—	1	30
216	L-1	Light	—	—	9° 08′ 45″	83° 45′ 25″	Uvita Bay, Costa Rica	2	—	4	0
	L-2	Light	—	—	9° 08′ 45″	83° 45′ 25″	"	3	—	2	0
217	L-1	Light	—	—	8° 19′	83° 36′	20 m. W. of Gulf of Dulce, Costa Rica	4	—	0	30

Station No.	Net No.	Type of Net	Depth		Position		General Locality	Date 1938	Bottom	Duration	
			Fathoms	Metres	N. Lat.	W. Long.				Hrs.	Mins.
								Mar.			
218	D-1	4′ dredge	100	183	8° 35′ 30″	83° 15′ 30″	Gulf of Dulce, Costa Rica.	9	Mangrove leaves.	0	6
218	D-2	4′ dredge	105	192	8° 35′ 50″	83° 16′ 40″	Gulf of Dulce, Costa Rica.	9	Mangrove leaves.	0	15
	D-3	4′ dredge	80–60	145–109	8° 38′ 10″	83° 16′ 45″	"	9	"	0	10
	D-4	2′ dredge	6	11	8° 38′ 15″	83° 10′ 25″	Golfito, Gulf of Dulce, Costa Rica	9	Mangrove leaves, mud, shells.	0	3
	D-5	2′ dredge	6	11	8° 38′ 15″	83° 10′ 25″	"	9	"	0	3
	D-6	2′ dredge	4	7.3	8° 38′ 15″	83° 10′ 25″	"	9	"	0	3
	D-7	2′ dredge	6	11	8° 38′ 15″	83° 10′ 25″	"	9	"	0	3
	D-8	2′ dredge	6	11	8° 38′ 15″	83° 10′ 25″	"	9	"	0	3
	L-1	Light	—	—	8° 38′ 12″	83° 10′ 45″	"	6	—	2	0
	L-2	Light	—	—	8° 38′ 12″	83° 10′ 45″	"	7	—	2	0
	L-3	Light	—	—	8° 26′	83° 08′ 40″	Pavon Bay, Gulf of Dulce, Costa Rica	9	—	2	0
219	T-1	Metre (3 nets)	300	540	8° 08′	83° 17′	25 m. W.xN. of Pt. Burica, Costa Rica.	10	—	4	3
	T-2	Metre (3 nets)	500	910	8° 03′	83° 12′	"	10	—	2	0
220	L-1	Light	—	—	8° 07′	82° 22′ 12″	Isla Parida, Gulf of Chiriqui, Panama.	11	—	4	0
	L-2	Light	—	—	8° 07′ 52″	82° 18′ 45″	"	12	—	2	30
221	D-1	4′ dredge	35	64	7° 54′ 45″	82° 04′ 32″	Gulf of Chiriqui, Panama.	13	Sandy mud.	0	5
	D-2	4′ dredge	35	64	7° 54′ 15″	82° 04′ 25″	"	13	"	0	5
	D-3	4′ dredge	35	65	7° 53′ 12″	82° 02′ 45″	"	13	"	0	5
	D-4	4′ dredge	38	69	7° 52′ 45″	82° 02′	"	13	"	0	8
	D-5	4′ dredge	40	73	7° 52′ 30″	82° 01′	"	13	"	0	10
222	D-1	2′ dredge	3	5.4	7° 45′ 51″	81° 32′ 21″	Bahia Honda, Pan.	18	Rocks, dead coral.	0	2
	D-2	2′ dredge	4–8	7.2–14.5	7° 45′ 46″	81° 32′ 23″	"	18	"	0	3
	D-3	2′ dredge	8	14.5	7° 45′ 42″	81° 32′ 24″	"	18	Dead coral.	0	3
	D-4	2′ dredge	11	20	7° 45′ 39″	81° 32′ 21″	"	18	Dead coral, shells, gr. mud.	0	3
	D-5	2′ dredge	11	20	7° 45′ 35″	81° 32′ 18″	"	18	Mud, shells, leaves.	0	10
	L-1	Light	—	—	7° 45′ 15″	81° 32′ 10″	"	13	—	2	15
223	L-1	Light	—	—	7° 32′	81° 52′ 30″	Bahia Hermosa, Coiba Is., Panama.	19	—	3	30
224	D-1	4′ dredge	40	73	7° 23′ 30″	82° 03′	Hannibal Bank, Pan.	20	Rocks, dead coral.	0	4
	D-2	4′ dredge	35	64	7° 23′ 30″	82° 03′	"	20	Rocks, mud, dead coral.	0	10
	D-3	4′ dredge	35	64	7° 23′ 30″	82° 03′	"	20	Sand, shells, algae.	0	15
225	T-1	Metre (3 nets)	500	910	7° 08′	81° 57′	11 m. SW.xW. of Jicaron Is., Panama.	20	—	2	31
226	L-1	Light	—	—	7° 05′	81° 27′	22 m. ESE. of Jicaron Is., Panama.	20	—	0	30
227	T-1	Metre (3 nets)	500	910	7° 00′	80° 40′	20 m. SW. of Morro de Puercos, Panama.	21	—	3	41
228	T-1	Metre (3 nets)	500	910	7° 00′	79° 16′	52 m. SE.xE. of Cape Mala, Panama.	25	—	4	30
229	L-1	Light	—	—	6° 27′	79° 00′	83 m. SE. of Cape Mala, Panama.	25	—	0	35

Station No.	Net No.	Type of Net	Depth		Position		General Locality	Date 1938	Bottom	Duration	
			Fathoms	Metres	N. Lat.	W. Long.				Hrs.	Mins.
								Mar.			
230	T-1	Metre (3 nets)	500	910	5° 10′	78° 42′	71 m. W.xS. of Cape Corrientes, Columbia.	26	—	4	2
231	L-1	Light	—	—	4° 30′	78° 33′	85 m. SW. of Cape Corrientes, Columbia.	26	—	0	35
232	D-1	2′ dredge	2–8	3.6–14.6	2° 57′ 30″	78° 11′	Gorgona, Island, Columbia.	31	Sand.	0	30
	L-1	Light	—	—	2° 59′	78° 11′	"	27	—	2	30
	L-2	Light	—	—	2° 59′	78° 11′	"	28	—	4	0
	L-3	Light	—	—	2° 59′	78° 11′	"	29	—	3	30
	L-4	Light	—	—	2° 59′	78° 11′	"	30	—	4	0
	L-5	Light	—	—	2° 59′	78° 11′	"	31	—	4	0
								Apr.			
233	T-1	Metre (3 nets)	500	910	4° 45′	78° 02′	55 m. SSW. of Cape Corrientes, Columbia.	3	—	4	33
234	T-1	Metre (3 nets)	500	910	7° 24′	78° 35′	24 m. W.xS. of Pinas Pt., Panama.	4	—	4	27